Contained within this document are my comments on FCC **Docket 04-37,** Broadband-Over-Powerline, hereinafter referred to as BPL:

To begin, some details of my background, to provide a frame of reference for the comments. I am a licensed GMDSS Radio Operator / Maintainer with Ship Radar Endorsement, #DBGB082489, issued 10 May, 2001. Prior to upgrading to this license, I held General RadioTelephone Operator w/ship Radar Endorsement License #PG-10-22037. This General RadioTelephone license was issued in May 1986. I am a licensed Professional Engineer (PE) in three states. I have a Bachelor of Science degree in Engineering, and have been involved in radio and communications since approximately 1972.

These comments will be organized into two general areas:

Concerns over the effects of BPL
Technical concerns with BPL itself

CONCERNS OVER THE EFFECTS OF BPL

I have significant concern that implementation of BPL as presently proposed will cause disruption to *existing* Medium Frequency (MF), High Frequency (HF) and Very High Frequency (VHF) communications. Test demonstrations of the various variants of BPL in the United States, along with similar efforts in other nations, such as several in Europe, Japan and others, have shown disruptive effects. The use of MF, HF and / or VHF 'subcarriers' on electrical power distribution circuits endanger the following:

1. Global Maritime Distress & Safety System (GMDSS)

   As part of the Safety of Life as Sea (SOLAS) treaties, of which the United States is a signatory, the GMDSS system is one of the primary methods for mariners to notify authorities and summon help in emergencies at sea. Frequencies in the 2, 4, 6, 8, 12, 16 & 156 Mhz maritime assignments are used for several required facets of GMDSS; Digital Selective Calling (DSC), Narrow Band Direct Printing (NBDP, also known as "SITOR") of Maritime Safety Information (MSI) Broadcasts, as well as calling and working voice communications channels. For specific frequencies utilized, refer to: http://www.navcen.uscg.gov/marcomms/gmdss/default.htm

   BPL has the potential to cause problems with reception of weak signals from vessels in distress. Even at my inland location in North Central Texas, I have the necessary equipment, and sometimes monitor the DSC distress channels.

2. Oceanic Air Traffic Control and Flight Information Regions (FIRs)

   The commercial air transport industry and US military aircraft utilize HF to communicate with air traffic control authorities while in flight over oceanic or remote land regions. This communication includes position reporting, which is essential to maintain safe aircraft separation. It is important to note that there is no viable radar coverage, and thus no ground based means of determination of aircraft position over open water or remote land areas. Reliable communication of these position reports is crucial to in flight safety. These same HF frequencies are also used for any over-water or remote land area in-flight emergency communications, in flight weather information, as well as business and other operational communications.

   For information on specific frequencies, refer to:

   http://www.faa.gov/ats/aat/ifim/ifim0109.htm
   (This listing is not all-inclusive)

   BPL has the potential to cause problems with reception of weak signals from aircraft not only in distress, but in routine operation. I have the necessary radio equipment, and frequently monitor these radio communications.

3. Other Official, Governmental users of HF

   Several other US Government agencies utilize HF and VHF for emergency and routine communications. Some of these organizations are the Federal Emergency Management Agency (FEMA), US Army Corp of Engineers (USACE), various entities within the Department of Defense (DoD) and more. Many state and local public safety and public service organizations rely heavily on dependable radio communication to do their work.

   For more information on but two of these Services, refer to:

   http://www.its.bldrdoc.gov/pub/oa-rpt/hf-ale/handbook/annex4.pdf
   http://rmr.cap.gov/docs/AlertStatus.pdf

   BPL has the potential to cause problems with reception of weak signals from emergency and routine communications from police, fire, and disaster recovery work, as well as routine business dispatch and control radio operations.

4. International Shortwave Radio Broadcasts

   Many nations, including the United States, have licensed international broadcasting operations. These shortwave broadcasts are protected by International Telecommunications Union (ITU) agreements. The US is a member of the ITU. These International shortwave broadcasts are transmitted in the HF band, between 2 and 21 Mhz. Many shortwave broadcasters, especially from Europe and Asia, target audiences in the United States, and beam transmissions in this direction.

   For more information, refer to:

   http://ac6v.com/SWL3.htm
   (This above Internet site courtesy of and Copyright © 1998 by Rod Dinkins - AC6V)

   BPL has the potential to cause major problems with reception of signals from international shortwave broadcasters. I have the necessary equipment, and frequently listen to broadcasts from Australia, Argentina, Japan, New Zealand, and many more. In my profession, I have frequent concern with Australian issues, and find the Radio Australia broadcasts quite informative and useful.

This list is by no means inclusive. It is important to note that I have not mentioned the Amateur Radio Service. I am not an Amateur Radio operator at this time. However, this is a Service I could become involved with sometime in the future, and wish it to remain viable. Much of my existing equipment would be useable in the Amateur Service. I will not take this line of thought beyond this point, since I am sure the Amateur Radio community will put forth its position on BPL far more capably than I can.

There are also other established communications Services, only two of which I mention, that could be impacted by BPL as proposed:

Citizen's Band (27 Mhz)

Time and Frequency Standards (National Institute of Standards and Technology NIST; Radio Stations WWV and WWVH).
http://www.nist.gov/public_affairs/releases/timefreqinfo.htm

BPL has the potential to cause reception disruption to both of the above.

TECHNICAL CONCERNS WITH BPL ITSELF

Broadband-Over-Powerline functions by means of waves of various frequencies being placed on existing electrical power distribution infrastructure.

1. It is widely thought, but not proven outright, as far as I know, that these additional 'subcarriers' on the power line will not affect electrically operated equipment. One area of concern could be synchronous equipment, that looks for the 60 hz cycle, to establish operating speed. It is conceivable that BPL could be seen as a harmonic, that could disrupt synchronous equipment. Another area of concern could be high-fidelity audio equipment, such as stereos, *AM / FM Radio Receivers,* and other AC Power operated units. A well designed & manufactured power supply should remove any 60 hz and harmonic ripple, but intentionally placing what would appear as 'white noise' to power supplies on the power line is making an already difficult task more difficult and less economic.

2. Power distribution lines are unshielded conductors. A fact of physics is that unshielded conductors radiate whatever it is they are conducting. Many variables are involved as to the intensity and effect of this radiation, but with the specifications as presently proposed for BPL, this would add MF, HF and VHF emissions to the spectrum. The effects of this radiation have been covered above. However, one interesting phenomenon would be effects of adjacent power lines, both carrying BPL. The photograph below shows the existing electrical infrastructure at my location:

(photo on next page)

The key feature is that there are two electrical distribution lines in front of my house. They are owned by different utility companies. In addition, there is a 69kV transmission line on the left, a 138kV line out of view farther to the left, and finally a 345 kV line crossing the road in the distance. As I presently understand it, only distribution lines will be used for BPL, so the transmission lines are not thought to be a problem. However, I cannot say with certainty that transmission lines will be free of BPL. Further, as I understand it, the electric utilities presently use sensing and some in-house signaling on their lines. I have some minor concern that if this sensing and signaling were to be disturbed or compromised by BPL, there could be electrical service problems and outages.

However, focusing on what I see as the most significant problem; the two distribution lines in the picture. As mentioned, these lines are owned by different utility companies. If both of these utilities implement BPL independently, there is a great likelihood *they will interfere with each other!* This could potentially escalate into each utility increasing the BPL power level, in an attempt to out-shout the other. I end up being the loser, with my radio equipment located approximately 100 feet from the nearest line.

Taking this line of thought one step further; consider the fact that power distribution systems are composed of three phases. Typically, only one of these phases serves an individual residence. Therefore, there will likely be differing BPL content on the three phases of a distribution line. It is *possible that a single provider's BPL may interfere with itself!*

SUMMARY

Free markets, choices and options are a basis of the American way of life, which I completely support. BPL is a communications alternative to existing means of Internet access, and deserves to be judged on its economic and technical merits.

The overall economic merits of BPL are outside the scope of these comments and my expertise. The personal economic consequences of BPL could be that the approximately $4000 of radio equipment I presently own could become much less useful and enjoyable. I would likely not purchase BPL at any price; I presently have dial-up service over the telephone line, which meets my needs, cost expectation and does not cause RF interference problems with my radio equipment.

To conclude, if BPL could be implemented on a truly non-interference basis *across the entire MF, HF and VHF spectrum,* then it should be placed onto the market, and allow the consumer to decide. However, due to the inescapable fact of overhead powerlines being antennae, and BPL employing RF carriers, RF interference from BPL to *existing, licensed* services is inevitable. "Notching out" specific frequencies from BPL may or may not meet the needs of a licensed service utilizing a fixed frequency, but I routinely monitor varying radio frequencies from 2 to 25 Mhz on HF alone. Therefore 'notching' would not be effective for my requirements, and probably would not be feasible for the BPL provider, either. Finally, as illustrated in the photograph above, there are no doubt many instances in which BPL will interfere with other BPL. Therefore, in its present configuration, BPL is not a technically viable means of global interconnection.